

# 2011 Military Health System Conference

## Identifying and Managing Environmental Health Threats in the AOR

*The Quadruple Aim: Working Together, Achieving Success*

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DoD(HA) Force Health Protection &  
Readiness

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# Agenda



- Linkage of Occupational and Environmental Health (OEH) Surveillance to the Quadruple Aim
- Theater OEH Surveillance Results
- Known/Potential CENTCOM Deployment OEH Threats
- Medical Surveillance and Epidemiologic Studies
- Managing the Threats

# The Quadruple Aim and OEH Surveillance



## Readiness

With active **OEH** and medical surveillance programs in place, environmental health threats can be identified, assessed, and managed as quickly as possible to preserve health and maximize mission accomplishment

## Experience of Care

By using the **OEH** surveillance data and summary products to populate individual longitudinal exposure records, the experience of care can be improved



## Population Health

**OEH** surveillance is a key component of Force Health Protection (FHP) and is accomplished for the prevention of illness and injury associated with environmental threats

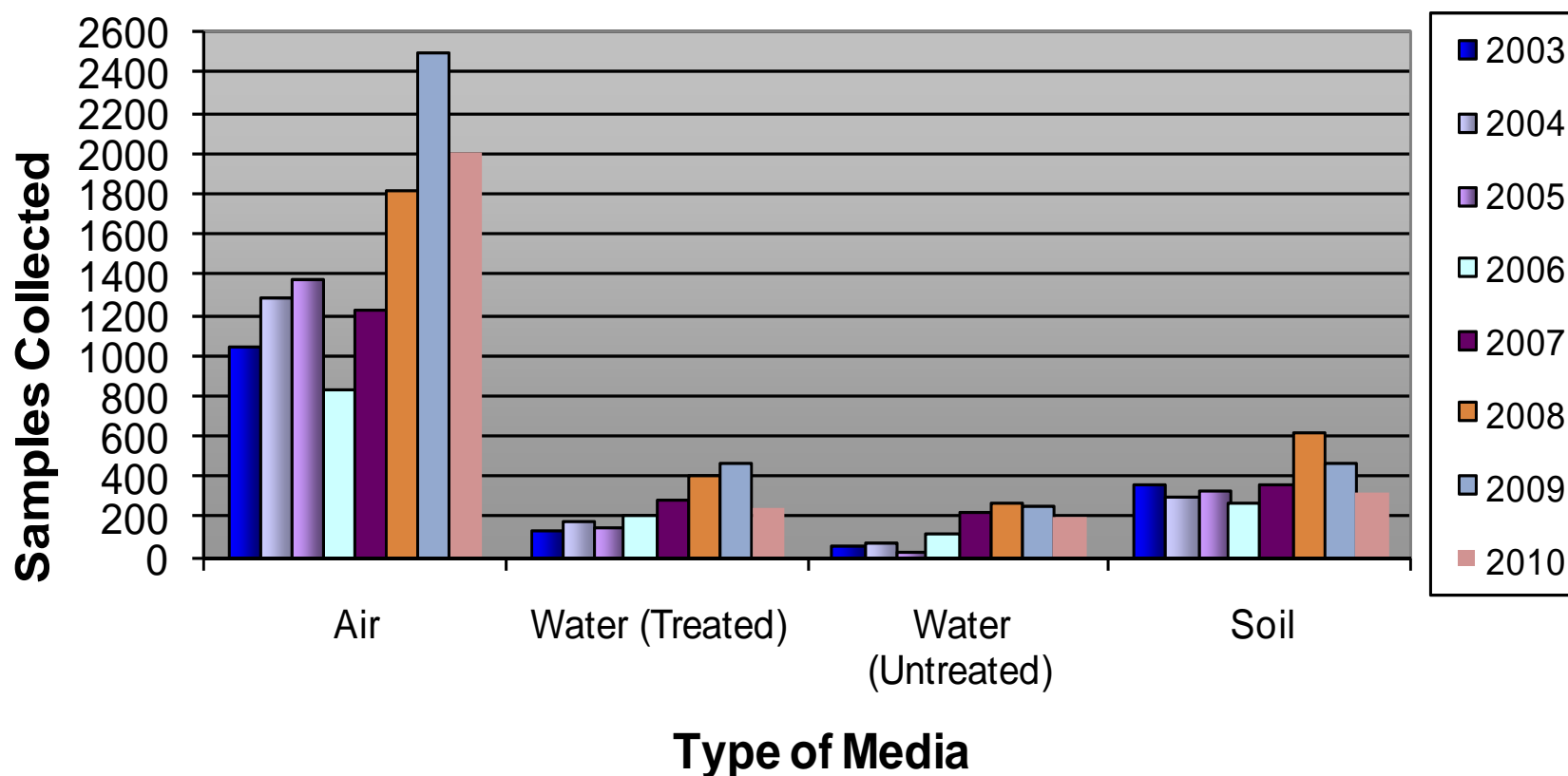
## Per Capita Cost

Costs can be reduced through early primary and secondary prevention measures which are informed by comprehensive **OEH** surveillance

# Number of OEH Samples for OEF/OIF per year (2003-2010)






**18460 Total Samples Collected 2003-2010**  
**2770 Samples Collected in 2010**






# OEF/OIF OEHS Monitoring Summary (2003 to 2010)



Media	# of Sites Sampled (2010 only)	# of Samples (2010 only)	Health Risk	Comments
Air	362 (91)	12102 (2004)	 Moderate	Personnel may be affected by transient respiratory health outcomes; possible chronic health outcomes associated with burn pits/PM
Water (Treated)	437 (130)	2071 (240)	 Low	Acute health effects possible, but in most cases would require significant consumption of water and personnel may acclimate to conditions.
Water (Untreated)	363 (126)	1243 (202)	NA	No risk estimate, because generally no exposure.
Soil	457 (68)	3044 (324)	 Low	Generally not enough exposure to contaminated soil to cause adverse health effects

## Key: Risk Level Definitions

<b>High</b>		Death, incapacitating, or irreversible acute, latent or chronic illness (e.g., severe eye irritation or blurred vision, severe dizziness or confusion, seizures, cancer, or effects on critical organs or organ systems), or severe disability.
<b>Moderate</b>		Moderate acute illness or disability (e.g., gastrointestinal symptoms such as vomiting or diarrhea), or chronic, or delayed-onset of illness or illness that results in minor long-term health effects.
<b>Low</b>		No health effects or minor/transient illness expected (e.g., skin irritation, respiratory allergies, nausea, headache, dermatitis),

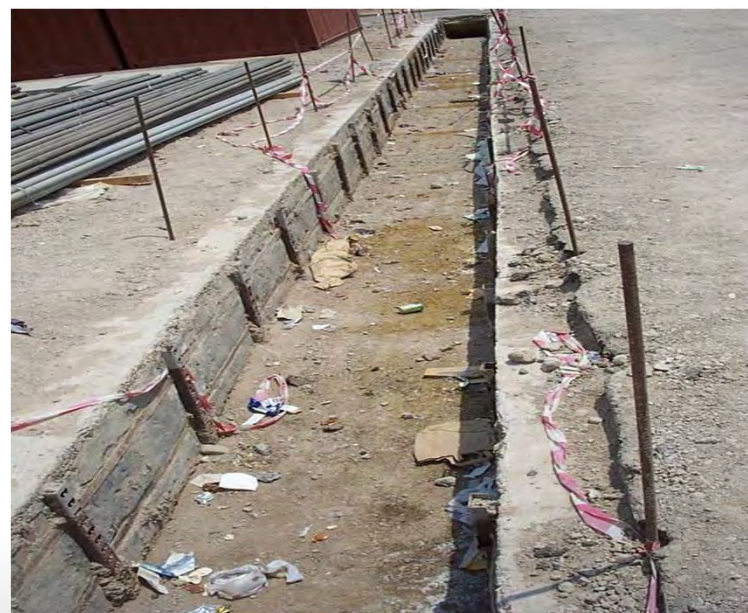
# Selected Known/Potential Theater OEH Threats



- Qarmat Ali -- Sodium Dichromate Dust (2003)
- Burn Pit Smoke Emissions
- Particulate Matter (PM) – Sand/Dust, Industrial Pollutants



# Qarmat Ali – Sodium Dichromate Exposures (2003)



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# Qarmat Ali Sodium Dichromate Exposures



- April-Sept 2003 – US personnel and contractors possibly exposed to sodium dichromate, a known human carcinogen
  - Approximately 750 National Guardsmen (IN, WV, SC, OR) who provided security
  - About 100 US Army Corps of Engineers AD & Civ personnel who advised contractors
  - A small number from the 413th Chemical Corps
- Oct 2003 – USAPHC (formerly CHPPM) Special Medical Augmentation Response Team-Preventive Medicine (SMART-PM) conducted environmental and clinical assessments

# Qarmat Ali Sodium Dichromate Exposures



- Summary of health effects from medical evaluation conducted in 2003
  - Most individuals: no signs/symptoms of exposure; normal chest x-ray, lab results, and pulmonary function tests (PFTs)
  - Some individuals: non-specific findings of nasal/resp irritation or inflammation, just as likely related to the harsh, desert conditions
  - Total chromium blood tests did not indicate evidence of overexposure to chromium (some limitations of the data)

# Qarmat Ali Sodium Dichromate Exposure Findings



- Exposures to low levels of sodium dichromate were of short duration, with most less than three weeks total time on site
  - Average exposure to Soldiers was 148 hours
- Short-duration exposures are not likely to result in long-term health effects
- Findings validated by Defense Health Board

# Burn Pit Smoke Exposures



# Theater Burn Pit Smoke Exposures



- 2008 Joint Base Balad Burn Pit Health Risk Assessment (then, largest burn pit in theater)
  - No long-term health effects expected; conclusions validated by Defense Health Board
  - However, did not consider combined exposures or elevated sensitivity in personnel
- Concerns with cancer/non-cancer endpoints
  - Chronic health effects alleged in 600+ veterans
  - Several dozen cases of respiratory disease in service members identified with possible “inhalational causes”



# Theater Burn Pit Smoke Exposures



- Concerns regarding cancer/non-cancer endpoints (cont)
  - Some media misquotes and distortion of facts
  - Service member lawsuits lodged against burn pit contractors
  - Strong Presidential/Congressional/VA/Media interest
    - U.S. Representative Bishop blog:  
<https://sites.google.com/site/burnpits/>

# Epidemiological Study Results for Assessment of General Pulmonary Health Risk



- Some epidemiological studies show modest, significant increased risk for deployment-related respiratory illness
  - Deployed soldiers had a 1.4 fold increased risk (14% vs 10%) for self-reported pulmonary symptoms (persistent/recurring cough/shortness of breath) (Smith *et al.*, 2009)
    - Showed no significant increase in risk for asthma, emphysema, or chronic bronchitis
  - Another study indicated veterans were 1.5 times more likely to develop new-onset asthma as compared to personnel assigned to the US (Szema, 2010)

# “Epidemiological Studies of Health Outcomes among Troops Deployed to Burn Pit Sites”



- Series of studies (7) performed by the Armed Forces Health Surveillance Center/Naval Health Research Center (May 2010)
  - Examined electronic medical record data for 25,000 personnel deployed from 1 Jan 2005 - 30 June 2007
  - Examined self-report survey data (Millennium Cohort) for over 18,000 who had deployed and were surveyed during June 2004 - February 2006 (baseline) and again June 2007 - December 2008 (follow-up)
  - Considered over 150 ICD-9s, including respiratory/cardiovascular disease, sleep apnea, rheumatoid arthritis, lupus, birth defects

# Electronic Medical Record Data: Incidence rates among Deployers and non-Deployers



- For nearly all health outcomes measured, up to 36 months after deployment, the unadjusted and adjusted incident rate ratios (IRRs) among personnel assigned to locations with burn pits who had returned from deployment was either lower than, or about the same as, those who had never deployed.
  - Iraq burn pit locations included Joint Base Balad and Camps Speicher and Taji
  - Non-burn pit locations included Camp ArifJan and Buehring (Kuwait), Korea, CONUS

# Incidence of Self-reported Respiratory Illnesses



- Incidence of newly reported asthma in exposed vs non-exposed was 1.63% vs 1.62%
- Incidence of chronic bronchitis or emphysema was 1.54% vs 1.46% in exposed vs non-exposed
- Prevalence of respiratory symptoms in exposed (16.1%-19.8% range ) vs non-exposed (15.4%-21.5% range)
- No significant findings found in any of sub-studies, including cumulative days of exposure and camp-to-camp comparisons



# “Epidemiological Studies of Health Outcomes among Troops Deployed to Burn Pit Sites”



- At this time, the studies taken together generally show little or no health impact, at the population level, several years post-deployment on the long-term health of personnel assigned to a burn pit location
  - The report has been submitted to the Defense Health Board for peer review and to the Institute of Medicine for their smoke exposure study
  - Data limitations cannot rule out chronic adverse health effects for some individuals

# Current DoD Public Health Statement on Burn Pit Exposures



*..... The DoD recognizes that acute symptoms due to smoke exposure may occur, including reddened eyes, irritated respiratory passages, and cough that may persist for some time. While no long-term health risks have yet been identified at a population-level, it is plausible that a smaller number of Service members may be affected by longer-term health effects, possibly due to combined exposures (such as sand/dust, industrial pollutants, tobacco, smoke and other agents) and individual susceptibilities such as preexisting health conditions or genetic factors.*

# Current DoD Public Health Statement on Burn Pit Exposures (Cont)



*... The DoD is continuing to reduce exposures to burn pit smoke by eliminating potentially harmful materials from the waste streams, and installing incinerators where feasible. The DoD will continue to study inhalational exposures, including the contribution from the smoke, and the health conditions of our Service members in order to determine the extent of any long-term health risks that may exist.*

*... All personnel who believe they have been harmed by the burn pit smoke should get the care they need and deserve.*

# 30-Ton Solid Waste Incinerator at Al Assad, Iraq





# Airborne Particulate Matter



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# Particulate Matter Exposures

- Particulate matter (PM) – blowing sand/dust, some industrial pollutants
- USACHPPM (USAPHC) Enhanced Particulate Matter Surveillance Study (2008)
  - Over 7.7 million analyses completed on approximately 2,700 air sample filters/15 soil samples from 15 different sites
  - Sand and dust in SWA is “not out of the ordinary”
  - Chemical and mineral content is similar to desert regions in the Sahara, and in the US and China

# Particulate Matter Exposures

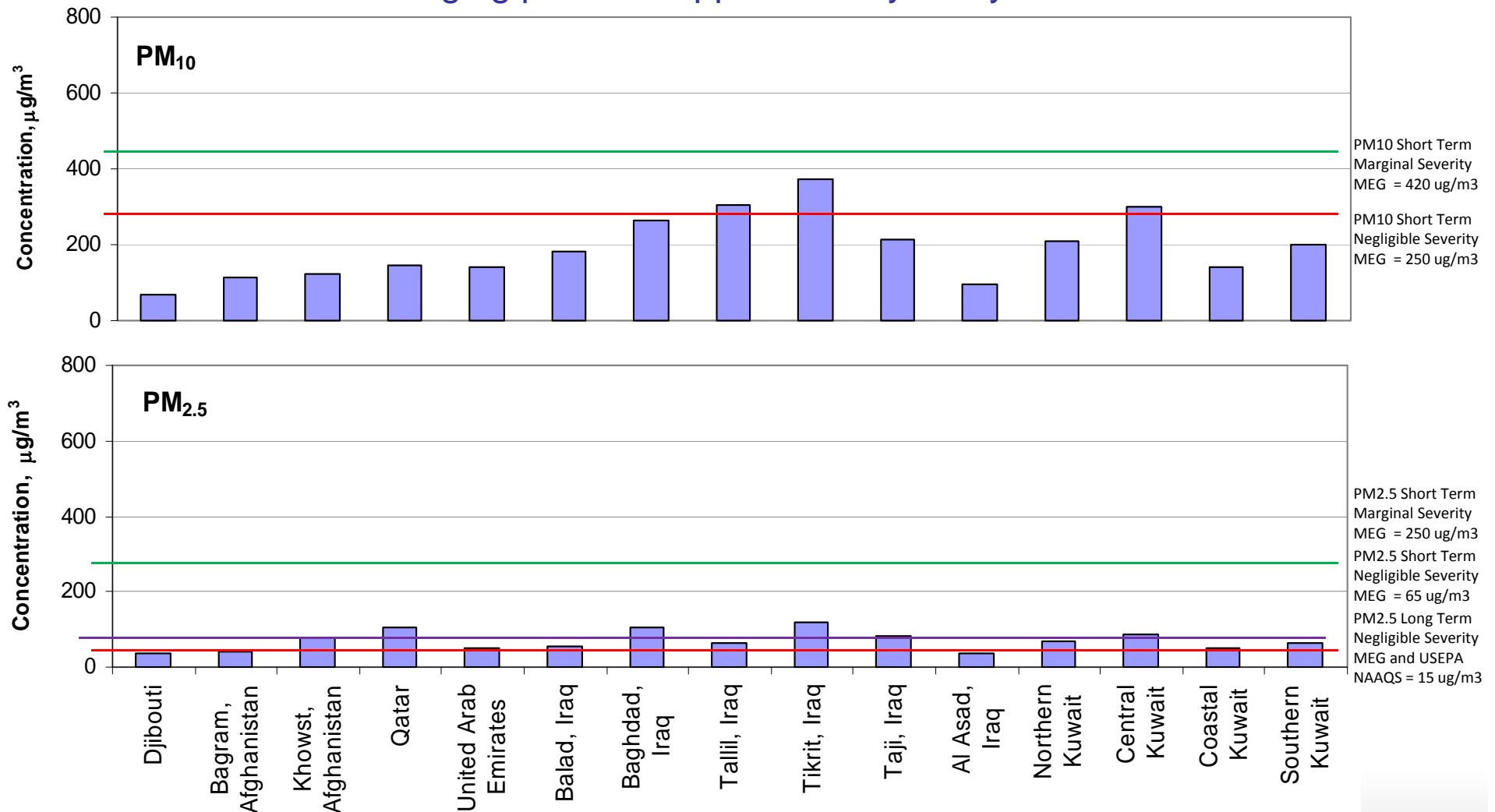


- SWA air monitoring levels for PM are above some US EPA National Air Quality Standards (NAAQS) and US Military Exposure Guidelines (MEGs)
- Acute health effects observed
- Chronic/latent health effects possible in some
- National Research Council's Committee on Toxicology Study was unable to determine whether SWA PM poses a long-term health risk

# Averaged particulate mass concentrations for PM10 and PM2.5 for 15 sites



Averaging period is approximately one year.



# Post-Deployment Respiratory Disease Conclusions



- Current clinical evidence for chronic post-deployment lung disease due to PM or burn pit smoke is minimal
  - The number of those who may be affected does not appear to be great
- Further studies are needed to determine if:
  - Preliminary epi results change over time
  - Pre- and post-deployment spirometry is indicated
  - There is any need for respiratory protection

# Medical Surveillance Disease and Injuries (D & I)



## CENTCOM (OEF/OIF) Combined Jan 01, 2005 to June 30, 2010

Disease and Injury Category	CUMULATIVE	LAST 3 MONTHS
Injuries, all causes	22%	24%
Psychiatric/Mental Illness	9%	10%
Dermatologic	7%	6%
Influenza Like Illness	4%	3%
Gastrointestinal Illness	2%	3%
Upper Respiratory	1%	1%
Other Defined Categories (<1.5% of Encounters)	4%	3%
All Others	46%	43%
Total Encounters	<b>3,050,082</b>	<b>181,499</b>

**NOTE:** Cumulative column reflects data from 01 JAN 2005 – 30 JUN 2010. Last 3 Months column reflects 01 JUL 2010 - 30 SEP 2010

**Data Sources:** Defense Medical Surveillance System (DMSS) and Theater Data Medical Store (TMDS) as of 12 OCT 2010  
**Prepared by:** Armed Forces Health Surveillance Center (AFHSC)



# Shifting Risk Management Paradigm



- Growth of civilian expeditionary workforce and increasing number of civilians potentially exposed/at risk
  - Civilians included in pre- and post-deployment screening
  - Some DOL CA-2 (work-related illness) claims filed
- Increased involvement of VA to include earlier intervention with Reserve Component personnel

# Shifting Risk Management Paradigm (Cont)



- Use of Department of Labor Office of Workers Compensation (OWC) processes for civilian expeditionary workforce exposure-related claims
- Need for expanded and more rapid sharing of data with VA as well as civilian providers
  - Data Transfer Agreement under development

# Risk Management Actions



- Clinical Care Implications
  - Need an increased awareness to the possibility of exposure-related encounters for both military members and civilians
  - Need increased involvement of, or referral to, occupational and environmental medicine consultants for cases beyond expertise of PCMs and general practitioners
  - Need to use appropriate encounter coding for in the EHR so exposure registries can be created, cohorts can be established, and when indicated, individuals can be followed over time

# Risk Management Actions



- Ensure all confirmed or possible exposure related conditions are documented in medical records – USE ICD-9 and V CODES
  - Will facilitate the assemblage of individual longitudinal exposure records in the new Electronic Health Record
  - **ICD 9 CODES 800-899** Injury and Poisoning
    - **980-989** Toxic Effects Of Substances Chiefly Nonmedicinal As To Source
    - **990-995** Other And Unspecified Effects Of External Causes

# Risk Management Actions



- **V CODES** (Supplementary Classification Of Factors Influencing Health Status And Contact With Health Services)
  - **V01** Contact with or exposure to communicable diseases
  - **V87** Other specified personal exposures and history presenting hazards to health (metals and organic chemicals, etc)



# Risk Management Actions (Ref DoDI 6490.03)



- Post-deployment Health Assessment (DD Form 2796 - Q #16) and Post-deployment Health Reassessment - Q #10) completion important in documenting self-reported exposures
  - Facilitates any needed long-term medical follow-up/surveillance including the establishment of cohorts and registries

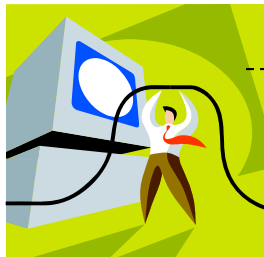
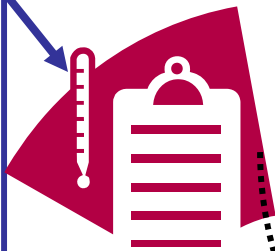
# Individual Deployment Longitudinal Exposure Record



## SSN Search:

Electronic Health Record

Defense Manpower Data Center – individual daily location database



**Sampling Data/Reports**  
**OEHSAs & POEMSs**  
**OEH and CBRN Incident Reports**

*In Garrison Locations*

*Deployment Location 2*

*Deployment Location 1*

- *Deployment history*

*Part A: Confirmed/Probable Exposures based on:*

- *Health effects*
- *Biomonitoring*
- *Personal monitoring*
- *Proximity Modeling*

*Part B: Possible Exposures*

- *Deployment Health Assessments*
- *OEH/CBRN incidents*
- *Personal Blast and Contaminant Tracking System – “those at risk”*

*Part C: Supplementary Ambient Monitoring Data*

- *OEHSAs & POEMSs*

E  
H  
R

# DoD Special Medical Surveillance Program – Sodium Dichromate



- Background
  - KBR employee (and some veterans) suing KBR for negligence involving sodium dichromate exposures at Qarmat Ali
  - Congress and White House highly interested
  - VA has implemented a special medical surveillance program for veterans who were possibly exposed
  - White House directed the DOD that this special medical surveillance program be a joint program

# DoD Special Medical Surveillance Program – Sodium Dichromate



- DoD responsible for approximately 100 AD and DoD current/former civilian employees who spent time at the site
  - Time spent on site ranged from a few days to several months – most only 2-3 weeks
  - Secretarial Designee Status provided for current and former civilian employees to obtain exams at MTFs
- VA will administer exams to veterans (including Guardsmen)

# DoD Special Medical Surveillance Program – Sodium Dichromate



- Details on the administration of exams/scheduling of the exams are being finalized
- Exam content (as developed by the VA):
  - Medical history and P.E.
    - Focused on ENT, respiratory system, and skin
  - Chest radiographs to be repeated every 5 years
- To be accomplished at MTFs
- Exam templates and registry function being developed in AHLTA



# DoD Special Medical Surveillance Program – Sodium Dichromate



- Plan: Administration of the DoD exams will be coordinated by the Army
  - Exam results will be QC'd by the office of the Chief of Environmental Medicine (USAPHC), consolidated, and results sent to the VA for data rollup
- Will likely serve as a template for future medical follow-up as required by the DoD or by the DoD-VA Health Executive Committee

# Identifying and Managing Environ. Health Threats in the AOR



- In Summary, my objective today was to instill sufficient knowledge of environmental health threats in the AOR and any associated health risks so you:
  1. Can articulate the current state of knowledge on these topics
  2. Will be more vigilant for any health outcomes that may be associated with environmental exposures (and know how to appropriately document them)
  3. Will be better prepared to play an appropriate role in the management of theater environmental health threats

# Identifying and Managing Environ. Health Threats in the AOR



## Questions?

### Contact information:

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